

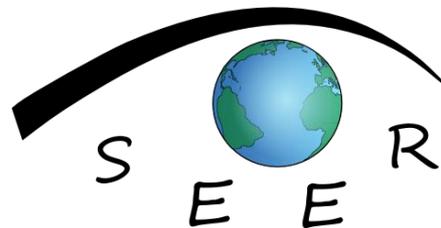
# UK National Ecosystem Assessment



## UK-NEAFO - Workpackage 3a: Economic Value of Ecosystem Services



Presented by Ian Bateman (PI) on behalf of the entire WP3a team at  
The UK-NEAFO meeting, Cambridge, 4<sup>th</sup> – 5<sup>th</sup> February 2013  
Contact: Ruth Welters [R.Welters@uea.ac.uk](mailto:R.Welters@uea.ac.uk)



# WP3a Analysis

**Water based recreation**



**Land based recreation**



**Farming**



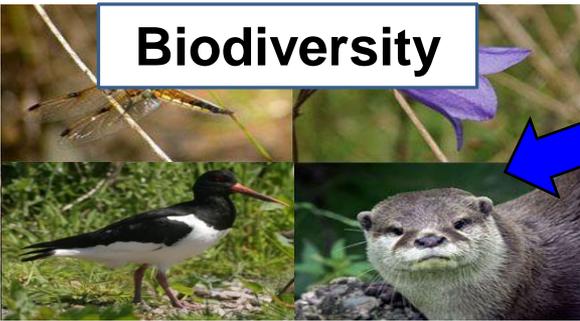
**Forestry**



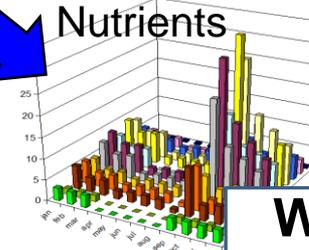
**Land use change**



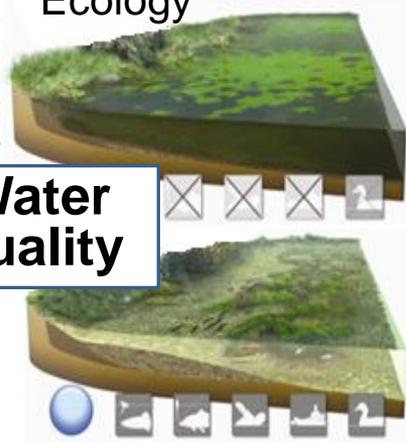
**Biodiversity**



**Nutrients**



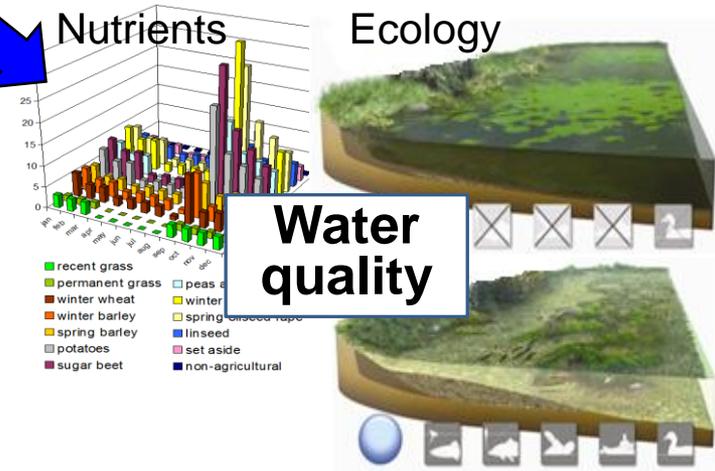
**Ecology**



**GHG & climate change**



**Water quality**



# WP3a Analysis

Re-estimation  
of NEA1  
model with  
new data

Water based  
recreation



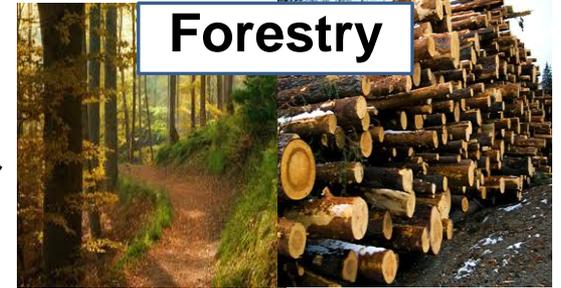
Land based  
recreation



Farming



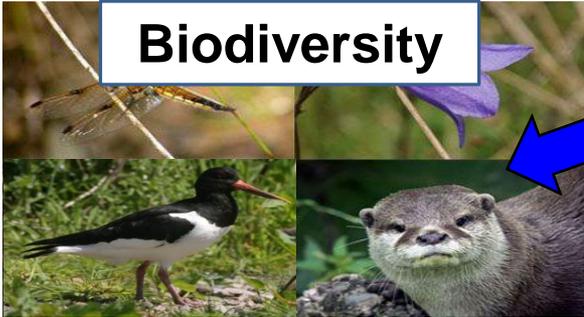
Forestry



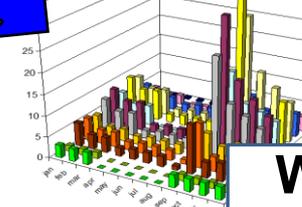
Land use  
change



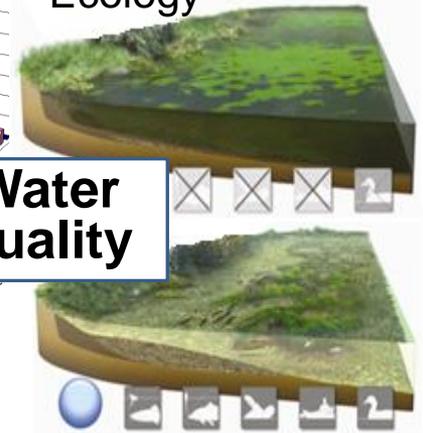
Biodiversity



Nutrients



Ecology



GHG & climate change



Water  
quality

# WP3a Analysis

New models with new data

Water based recreation



Land based recreation

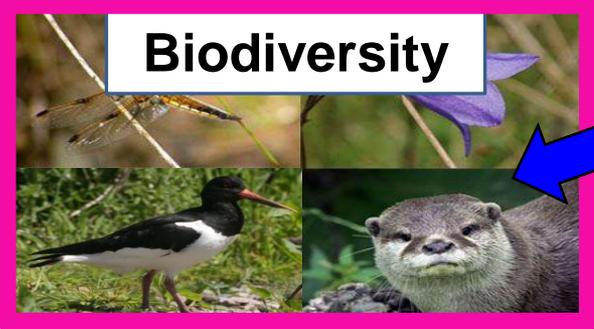


Farming

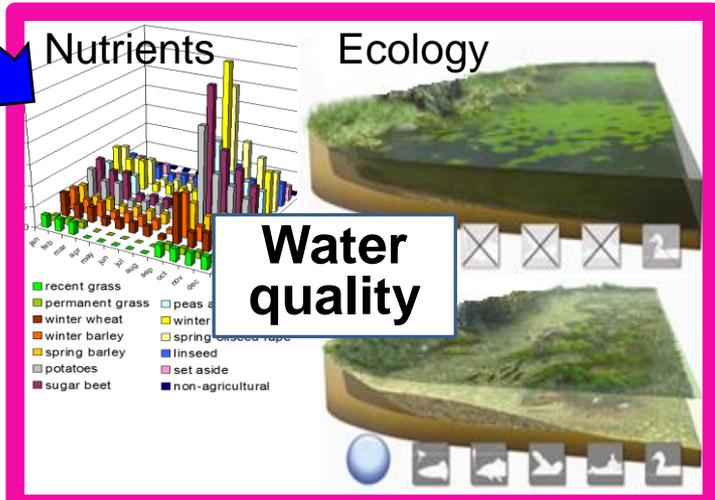


Forestry

Land use change



Biodiversity



Water quality



GHG & climate change

# WP3a Analysis

Water based recreation



Land based recreation

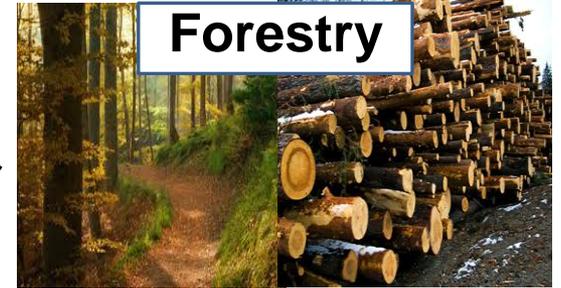


Farming



New field work with original data and new models

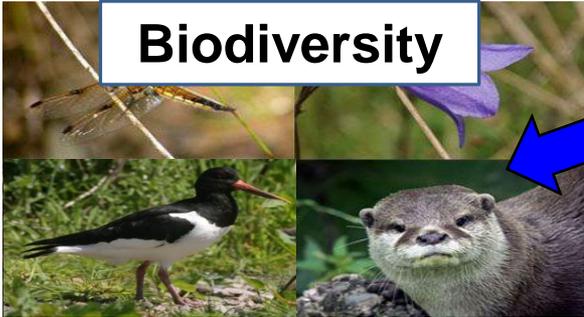
Forestry



Land use change



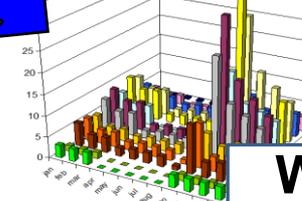
Biodiversity



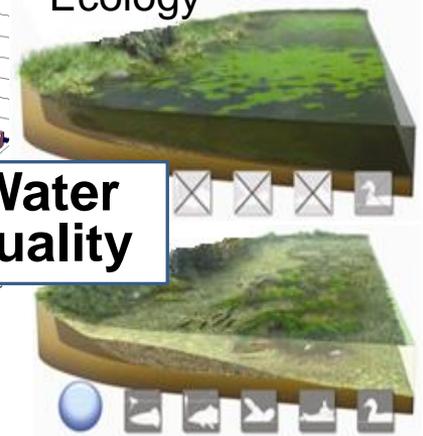
GHG & climate change



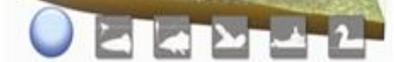
Nutrients



Ecology



Water quality



# WP3a Analysis

New data and new models

Water based recreation



Land based recreation



Farming



Forestry



New survey

- Stratified large sample, at-home, face-to-face, survey across wide range of: Incomes; Social groups; Ethnicity; Urban/rural location; Population density; Access to rivers and other recreational resources
- Novel multi-method approach captures behavioural and stated preference data with values derived from each
- All data spatially referenced to high degree of accuracy
- Very varied levels of water quality
- Therefore results should be highly transferable

CH<sub>4</sub>

N<sub>2</sub>O

CO<sub>2</sub>

Soil



## WP3a – Deliverables

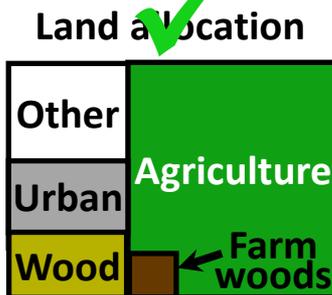
- Develop models of each of the following systems:
  - Agriculture (output values and incomes)
  - Forestry timber yield and values
  - Greenhouse gas balance and values for all land uses
  - Water quality measures (and treatment costs if data is made available)
  - Recreation numbers and values
  - Biodiversity indicators (based on BBS data)
- Integration: programming all models together
- Analysis of the impacts of change in policy, environment, markets
- Application to the optimal location of new forests (response to IFP)

## Beyond the UK-NEAFO Time Horizon

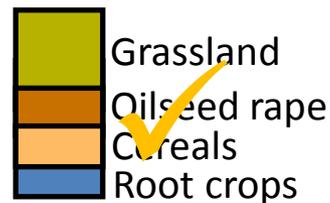
- Integration: faster programming times for all models
- Further analysis of the impacts of change in policy, environment, markets; e.g.:
  - Optimal location of new forests (within NEAFO timeline)
  - Trade-offs of attaining WFD good ecological status
  - Reform of the CAP
  - ‘Sustainable intensification’
  - Climate change impacts on all of the above
- Incorporating uncertainty; e.g.:
  - Within model, across linkage, error
  - External uncertainty – e.g. extreme weather impact
- From “What If” to “What’s Best” – optimal land use for the UK
- Developing desktop policy tools – software engineering

# UK-NEAFO WP3a: Progress to date

**MASTER DATABASE**  
 Max unit: 2km grid squares  
 Underpins all analyses



**Econometric model:  
 Farm land use shares**



**Biodiversity**



**Greenhouse gases**

**Timber values**



**Progress**

Awaiting data

Interim analysis complete

Final analysis complete



**Land based recreation**



**Population characteristics**



**Water quality**



**Water based recreation**



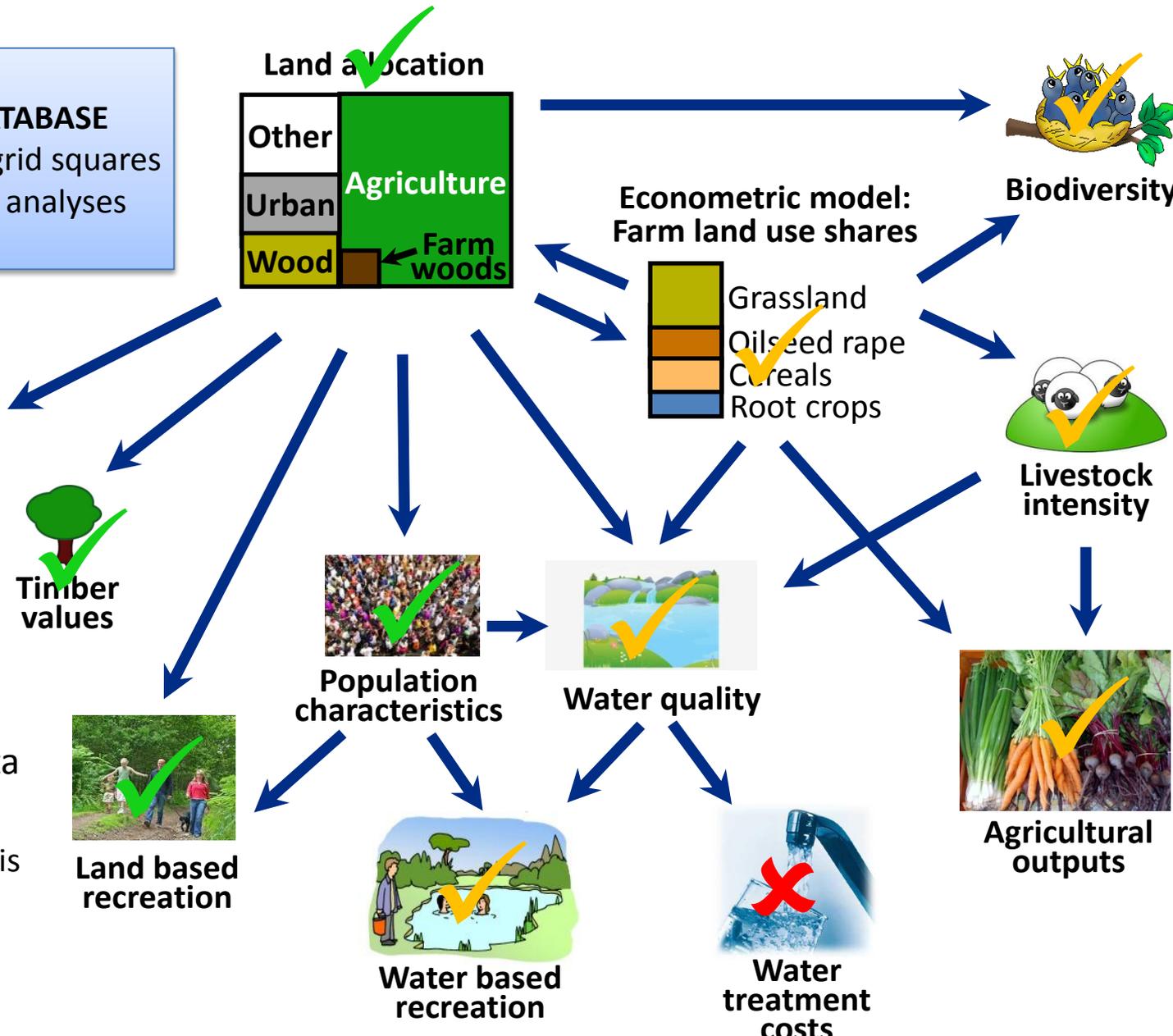
**Water treatment costs**



**Livestock intensity**



**Agricultural outputs**

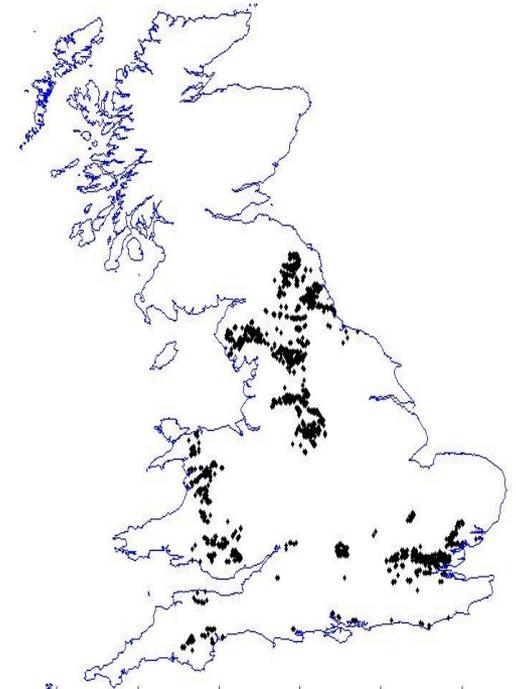


# Example simulation prepared for UK-NEAFO meeting

## Policy response to Independent Forestry Panel

- IFP recommend major increase in woodland
- Discussions with policy makers regarding feasible responses
- Mix of policy & market interventions simulated:
  - Total new planting of 250,000ha
  - England and Wales only
  - Substantial proportion allocated to peri-urban locations to generate recreation values
  - No planting on peatlands, wetlands or designated areas
  - Remainder allocated according to comparison of agricultural and woodland market values

## Results from example analysis prepared for UK-NEAFO meeting

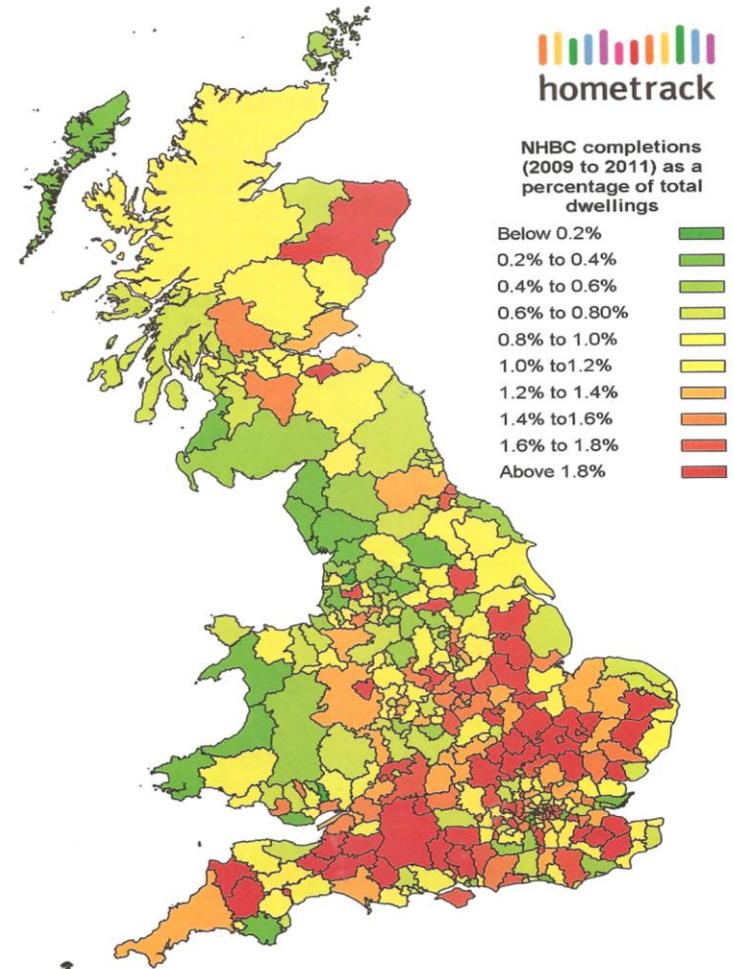


**Note:** The above analysis is incomplete – it is intended purely to illustrate the type of output that the project will produce. The above results **will change significantly** as the analysis is completed

# WP3a: Workplan for UK-NEAFO and beyond

- Complete all models & integration analysis
- Validation testing
- Extensions (subject to data availability and time constraints):
  - Impact on water treatment costs
  - Impacts of proposed house building
- The further analyses outlined in this presentation represent high value for money extensions. We will approach the research councils (notably ESRC) to request funding for these analyses. Defra, the Environment Agency and others have expressed interest in such work and are encouraged to support the necessary funding.

Official forecasts for house building to 2025 as percentage of stock (283, 000 pa; historical average 161,000 pa)



# UK National Ecosystem Assessment



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